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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,608	12/05/2003	Robert S. Chau	42P14705D	9763

7590 07/22/2004

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EXAMINER

NGUYEN, DAO H

ART UNIT PAPER NUMBER

2818

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/728,608	CHAU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Dao H Nguyen	2818	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 31-47 is/are pending in the application.
- 4a) Of the above claim(s) 45-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/05/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. In response to the communications dated 12/05/2003, claims 31-47 are active in this application as a result of the cancellation of claims 1-30 in the Preliminary Amendment.

### **Acknowledges**

2. Receipt is acknowledged of the following items from the Applicant.

a. Information Disclosure Statement (IDS) filed on 12/05/2003. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

b. This application is a Divisional of the co-pending Application Serial No. 10/306,640 filed 11/27/2002.

### **Drawings**

3. The drawings are objected to for the following reasons.

Figure 1 not designated by a legend such as "Prior Art". The Legend is necessary in order to clarify what applicant's invention is (see MPEP § 608.02g).

### **Specification**

4. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Cancellation**

5. The following cancellation has been made to the claim(s) upon request/agreement by applicant during a telephone conversation with Attorney Michael A. Bernadicou on 07/19/2004:

Cancel claim(s) 45-47 (These claims had been elected in parent application 10/306,640, and searches had been done on them).

### **Claim Objections**

6. Claim 36 is objected to for the following reason: In claim 36, line 2, a space should be inserted between "InP" and "GaSb".

### **Claim Rejections - 35 USC § 112**

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7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim(s) 39 is/are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 39, the material term "hefium nitride" is not clearly defined the subject matter regarded as the invention. What is "hefium"? This material does not exist in the Periodic Table of Elements. Is it Hafnium (Hf) or Helium (He) instead?

### **Claim Rejections - 35 USC § 102**

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

10. Claim(s) 31-44 is/are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,430,310 to Shibasaki et al.

Regarding claim 31, Shibasaki discloses a method of forming a transistor, as shown in figures 3, 8, and 10-22, comprising:

forming a narrow bandgap semiconductor film 3 on an insulating substrate 1 (col. 8, lines 65-68; col. 15, lines 51-54),

forming a gate dielectric layer 4 on said narrow bandgap semiconductor film 3 (figs. 3, 8, 10);

forming a gate electrode 6 on said gate dielectric 4; and

forming a pair of source/drain regions 5 & 7 adjacent to said narrow bandgap semiconductor film 3 (see also column 10, line 51 to column 12, line 24; column 13, line 44 to column 19, line 14).

Regarding claim 32, Shibasaki discloses the method wherein said narrow bandgap semiconductor film has a bandgap of less than or equal to 0.7 eV. This is an inherent material property of InAs.

Regarding claim 33, Shibasaki discloses the method wherein said narrow bandgap semiconductor film 3 is selected group consisting of InAs, PdTe and InSb. See col. 13, lines 56-58.

Regarding claim 34, Shibasaki discloses the method wherein said source/drain regions 5&7 are formed from a semiconductor film having a larger bandgap than said narrow bandgap semiconductor film. See col. 14, line 35 to col. 16, line 17.

Regarding claim 35, Shibasaki discloses the method wherein said source/drain regions are formed from a compound semiconductor. See column 15, line 44 to column 16, line 3.

Regarding claim 36, Shibasaki discloses the method wherein said semiconductor film of said source/drain regions is selected from the group consisting of InAlSb, InP, GaSb, GaP, and GaAs. See col. 15, line 44 to col. 16, line 3.

Regarding claim 37, Shibasaki discloses the method wherein said source/drain regions are formed from a metal film. See col. 14, line 35 to col. 16, line 17.

Regarding claim 38, Shibasaki discloses the method wherein said metal film forms a Schottky barrier with said narrow bandgap semiconductor film. See col. 15, line 44 to col. 16, line 17.

Regarding claim 39, Shibasaki discloses the method wherein said metal film is selected from the group consisting of titanium nitride, tantalum nitride. See col. 15, line 44 to col. 16, line 3.

Regarding claim 40, Shibasaki discloses the method wherein said gate dielectric layer comprises a deposited high dielectric constant film. See col. 14, line 35 to col. 15, line 43.

Regarding claim 41, Shibasaki discloses the method wherein said gate electrode comprises a metal film. See col. 16, lines 5-17.

Regarding claim 42, Shibasaki discloses a method of forming a transistor, as shown in figures 3, 8, and 10-22 comprising:

forming an InSb alloy film 3 on an insulating substrate 1 (col. 8, lines 65-68; col. 15, lines 51-54),

forming a high dielectric constant gate dielectric film 4 on said InSb alloy film (col. 14, line 35 to col. 15, line 43; and figs. 3, 8, 10);

forming a metal gate electrode 6 on said gate dielectric layer; and

forming a pair of source/drain regions 5\$7 on opposite sides of said gate electrode on said insulating substrate 1 (see also column 10, line 51 to column 12, line 24; column 13, line 44 to column 19, line 14).

Regarding claim 43, Shibasaki discloses the method wherein said source/drain regions are formed from a metal film. See col. 16, lines 5-17.

Regarding claim 44, Shibasaki discloses the method wherein said source/drain regions are formed from a wide bandgap semiconductor film. See col. 14, line 35 to col. 16, line 17.

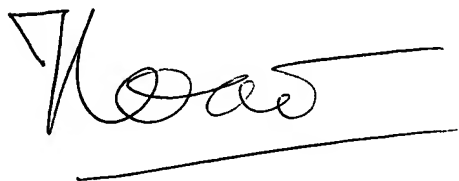


### Conclusion

11. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a horizontal line underneath.

David Nelms  
Supervisory Patent Examiner  
Technology Center 2800

Dao H. Nguyen  
Art Unit 2818  
July 19, 2004